

**DESCRIPTION OF TWO NEW SPECIES OF *POLYCENTROPUS*
FROM ALABAMA WITH A CHECKLIST OF THE
POLYCENTROPUS CONFUSUS SPECIES-GROUP
(TRICHOPTERA: POLYCENTROPODIDAE)**

STEVEN W. HAMILTON, STEVEN C. HARRIS, AND PAUL K. LAGO

Center for Field Biology and Department of Biology,
Austin Peay State University, Clarksville, Tennessee 37044;
Aquatic Biology Program, Department of Biology, University of Alabama,
Tuscaloosa, Alabama 35487; and
Department of Biology, University of Mississippi,
University, Mississippi 38677

Abstract.—Two new species of the *Polycentropus confusus* species-group are described. *Polycentropus alabamensis*, n. sp. is found in small streams primarily in northeastern Alabama and *P. vernus*, n. sp. was collected from small headwater and intermittent streams of the Cumberland Plateau. Also included is a checklist of the *P. confusus* species-group. This group comprises 14 species in addition to the new species described herein. All species of this group occur in eastern North America.

Until recently very little was known about the trichopteran fauna of Alabama and the Southeastern United States, in general. Surveys of Alabama caddisflies conducted by one of us (SCH) since 1981 have revealed a large number of species in this state including many undescribed species. Herein we describe two new species of the *Polycentropus confusus* species-group.

The species of this group are easily recognized by features of the male terminalia (cf. Figs. 1, 2). These features include the long, thin, curved dorsal processes (d.p.) of the preanal appendages (pre. app.), the shorter, slightly curved intermediate appendages (int. app.), the membranous combined segments IX and X (IX+X), the erect dorsobasal process on the inferior appendages (inf. app.), and the curved, relatively simple phallus containing a large, tubular phallic sclerite. (ph. sc.).

Including the two new species, this group comprises 16 described species variously distributed throughout eastern North America. An additional new species has been discovered in Arkansas (D. E. Bowles, pers. comm.) and may be endemic to the highlands of that region. Following the descriptions, we provide an alphabetized checklist of the species of the *confusus* species-group and the Provinces and States from which they are known (Hamilton, 1986).

The holotypes and several of the paratypes of both new species are deposited in the National Museum of Natural History, Washington, D.C. The other paratypes are deposited in the insect collections of the University of Alabama, Clemson University, Illinois Natural History Survey, and those of the authors. Most specimens were collected at ultraviolet lights, others, including a male metamorphotype were hand-collected, usually with a sweep net. All material is preserved in 80% ethanol.

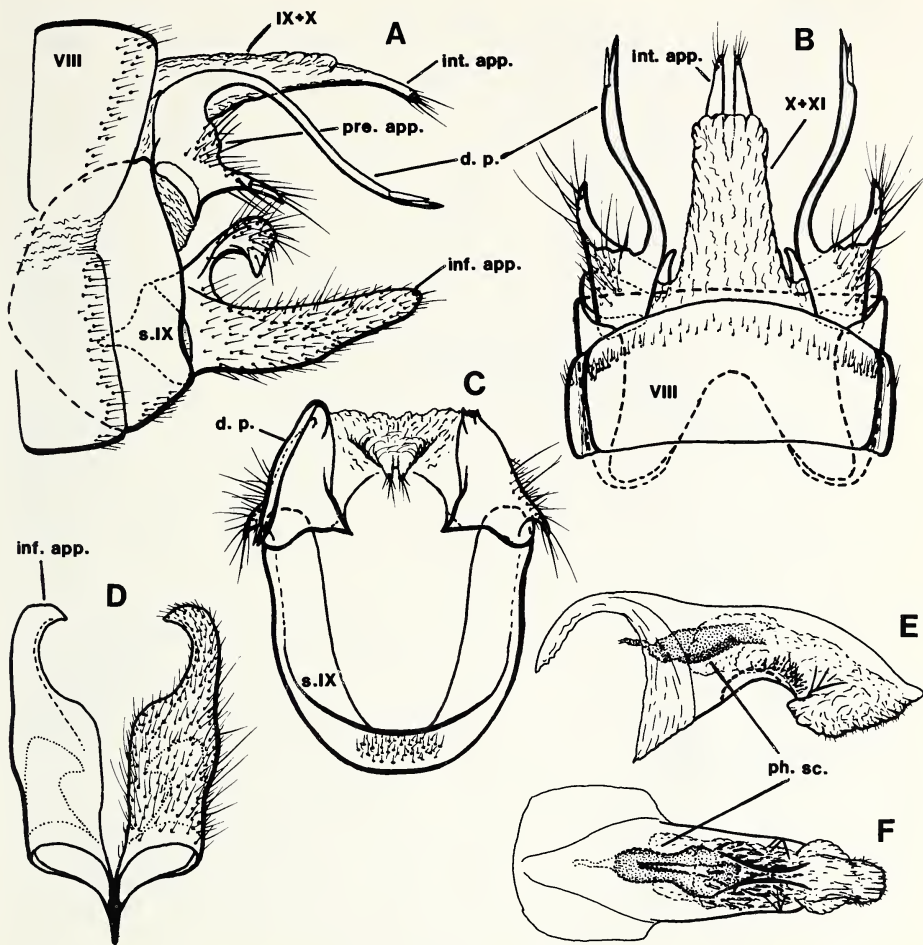


Fig. 1. *Polycentropus alabamensis*, male terminalia. A. Left lateral. B. Dorsal. C. Caudal. D. Inferior appendage, ventral. E. Phallus, left lateral. F. Phallus, dorsal. Abbreviations: d.p., dorsal process of preanal appendage; inf. app., inferior appendage; int. app., intermediate appendage; IX+X, combined ninth and tenth segments; ph. sc., phallic sclerite; pre. app., preanal appendage; s.IX, ninth sternite; VIII, eighth tergite.

***Polycentropus alabamensis* Hamilton, Harris and Lago, new species**
(Fig. 1, A–F)

Polycentropus new species 12, Hamilton, 1986:70–71, fig. 4.2.

Polycentropus n. sp. (nr. *elarus*), Lago and Harris, 1987:258.

Male. Fore wing length 5.2–7.6 mm. Body pale brown to yellow below, dorsum of head and thorax darker, with long, erect setae; fore wings clothed with fine, brown setae, with numerous scattered intervenal areas of pale setae (in alcohol). Male terminalia as in Figure 1. Abdominal sternite IX (s.IX), large, semicircular in lateral

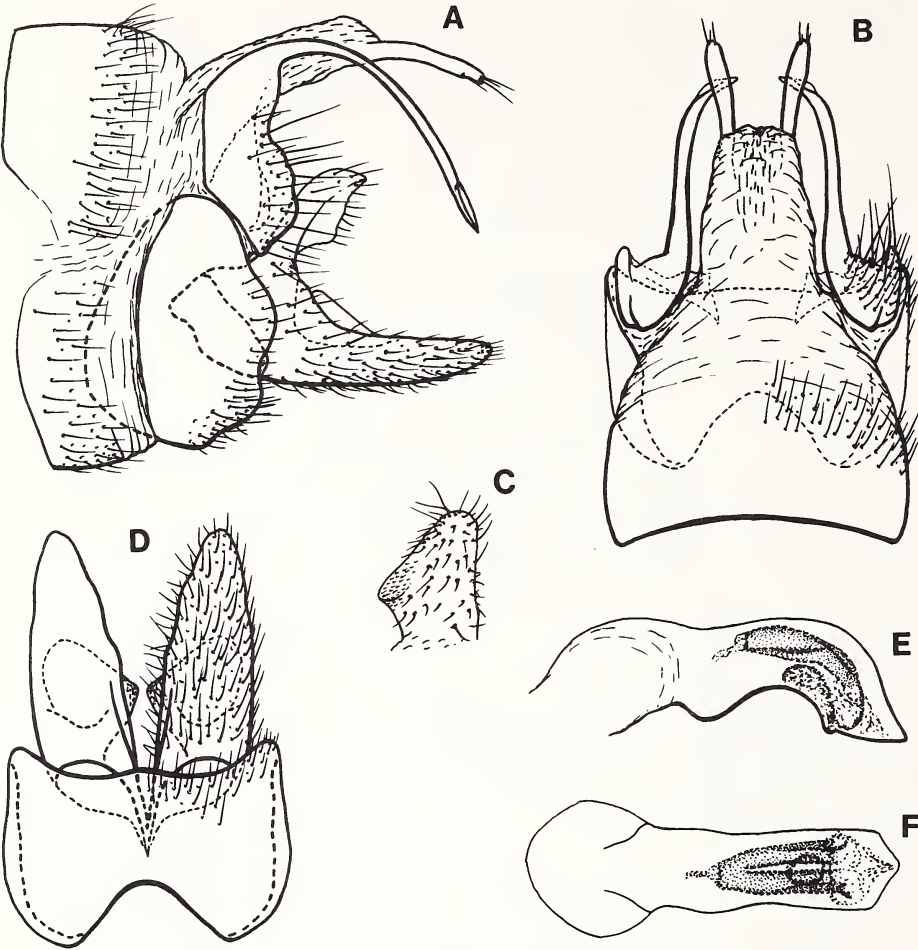


Fig. 2. *Polycentropus vernus*, male terminalia. A. Left lateral. B. Dorsal. C. Dorsobasal arm of inferior appendage, posterior. D. Ventral. E. Phallus, left lateral. F. Phallus, dorsal.

aspect, anterior margin rounded, posterior margin nearly straight; in ventral aspect anterior margin deeply emarginate. Intermediate appendages (int. app.) apically free, slightly decurved; proximally fused to venter of membranous segment IX and X (IX+X). Body of each preanal appendage (pre. app.) short, with prominent, acute caudoventral point, dorsal process (d.p.) slightly sinuate, decurved basad, recurved distad. Each inferior appendage (inf. app.) with elongate ventral portion, in lateral aspect distal half slightly narrower than basal half, in ventral aspect greatly narrowed beyond middle with apex acute, curved mesad; dorsobasal arm prominent, in lateral aspect "neck" long and thin, enlarged apex "goose-head" shaped with acute ventrally directed point. Phallobase tubular, moderately decurved, narrowed apicad, larger basad, with mesoventral concavity, apicodorsal area constricted; distal membrane

with microspines; phallic sclerite moderately long, in dorsal aspect narrowed at middle, enlarged slightly distad, with narrowed distal portion.

Discussion. This species is most closely related to *P. elarus* as evidenced by the similar apical narrowing of the inferior appendages, the shape and size of the dorsobasal arm of the inferior appendage, the similar shape of the preanal appendages, and the sinuate curvature of the dorsal process of the preanal appendage. *Polycentropus alabamensis* can be distinguished from *P. elarus* and the other *confusus* group species by the prominent, acute, caudoventral point on each preanal appendage and the narrowed, incurved apex of each inferior appendage.

This species is most commonly collected in small streams of the Cumberland Plateau physiographic region, except for several specimens taken in Choctaw County which is in the Coastal Plain physiographic region. This area of Choctaw County, the Red Hills, is hilly and atypical of the region both in physiography and fauna.

Types: *Holotype.* Male, United States: Alabama: Lawrence County: tributary to Bee Branch below falls, Bankhead National Forest, T8S-R9W-Sec. 26, 28.v.1985, S. C. Harris. *Paratypes.* Same data as holotype, 8 males; same data as holotype except Bee Branch, 2 males; Marshall County: Thompson Falls on Mink Creek, 3 mi E. of Arab, 28.v.1985, 4 males, P. E. O'Neil and R. L. Smith; Tuscaloosa County: Little Tyro Creek, 6 mi SE Berry, T17S-R10W-Sec. 11, 18.v.1982, 1 male and 26.v.1982, 1 male, S. C. Harris and P. E. O'Neil; Hurricane Creek on unmarked Co. Rd., 3 mi SE Brookwood, 7.v.1985, 2 males, S. C. Harris; same data except, 7.vi.1985, 2 males, P. E. O'Neil and R. L. Smith; Keeple Creek near jct. with Hurricane Cr., 3.5 mi SW Brookwood, 7.v.1984, 1 male, P. E. O'Neil and R. L. Smith; Fayette County: Tyro Creek on unmarked Co. Rd., 3.5 mi S Berry, 25.vii.1983, 1 male, S. C. Harris; Blue Water Creek at Bluewater Trace Road, 25.v.1983, 2 males, S. C. Harris; Franklin County: Dismal Branch at Dismal Wonders Garden, 25.vi.1983, 2 males, S. C. Harris; tributary to Dismal Branch at Dismal Wonders Garden, 25.vi.1983, 2 males, S. C. Harris; same data except 29.vi.1983, 1 male, S. C. Harris; Dismal Branch at falls, in Dismal Wonders Garden, 29.vi.1983, 1 male, S. C. Harris; Dismal Branch below canyon at Dismal Wonders Garden, 29.vi.1983, 1 male, S. C. Harris; Choctaw County, spring along Hwy. 17, 4 mi SW Butler, 6.vi.1983, 3 males, S. C. Harris and P. E. O'Neil; same data except 16.v.1982, 6 males, S. C. Harris; Jefferson County: Dry Creek at Co. Hwy. 132 near Trussville, 28.v.1983, 2 males, S. C. Harris; Cahaba River at Interstate-59, 26.vi.1985, 1 male, P. E. O'Neil.

Etymology. Latin, "from Alabama." All specimens currently known are from Alabama.

***Polycentropus vernus* Hamilton, Harris and Lago, new species**
(Fig. 2, A-F)

Polycentropus n. sp. (nr. *chelatus*), Lago and Harris, 1987:258.

Description: *Male.* Fore wing length 2.8–3.6 mm. Body pale brown to yellow below, dorsum of head, meso- and methathoraces darker with long, erect setae, prothorax lighter; fore wings clothed with fine brown setae, with scattered area of pale setae in distal, intervenal areas (in alcohol). Male terminalia as in Figure 2. Abdominal sternite IX large, semicircular in lateral aspect, anterior margin more curved ventrad, pos-

terior margin moderately sinuate; in ventral aspect anterior margin deeply emarginate. Intermediate appendages apically free, slightly decurved, proximally fused to venter of membranous segments IX and X. Body of preanal appendage short with broad, very shallow emargination of posterior margin; dorsal process long and evenly decurved. Each inferior appendage with elongate ventral protion, in lateral aspect only slightly narrowed distad, in ventral aspect narrowing gradually distad; dorsobasal arm of the inferior appendage prominent, in lateral aspect "neck" short and membranous on posterior surface, enlarged apex with in-turned blade-like portion longer than "neck," apex curved slightly posteriad, in posterior aspect this part triangular; mesal point with numerous small spines. Phallobase tubular, moderately decurved, with ventral swelling basad, apex slightly pointed in dorsal aspect, internally with spicule-covered membrane; phallic sclerite moderately elongate, in dorsal aspect slightly narrowed posteriad.

Discussion. This new species is most similar to the *confusus* group species with the more elongate "head" or enlargement on the dorsobasal arm of the inferior appendage. These species are *P. chelatus*, *P. confusus*, *P. floridensis*, *P. neiswanderi*, *P. pentus*, and *P. thaxtoni*. Owing to the suggestion of one of us (SWH), this species has been listed as "*P. n. sp. (nr. chelatus)*" by Lago and Harris (1987), but it appears to be more similar to *P. pentus* and *P. floridensis*. The new species can be separated from the above mentioned species through a combination of several characters including the shape of the body of the preanal appendage, the size and shape of the dorsal arm of the inferior appendage, the length and shape of the ventral arm of the inferior appendage, and the shape of the phallus. On *Polycentropus vernus* the emargination of the body of the preanal appendage is very shallow compared to *P. floridensis* and *P. thaxtoni* and is also different from that of other members of the *confusus* group. The phallus of the new species with its basoventral swelling is only similar to *P. floridensis* and *P. pentus*. The shape of the inferior appendage can be used to separate these two species from *P. vernus*. In *P. pentus* the dorsobasal arm of the inferior appendage is strongly curved, almost sickle-shaped, while in the new species it is triangular. Also, in *P. pentus* the mesobasal tooth on the basal arm of the inferior appendage is little developed, while it is well developed in both *P. vernus* and *P. floridensis*. While the dorsobasal arm of *P. floridensis* is similar to that of the new species, the lateral margin of the basal arm is more excavated, exposing the relatively prominent mesobasal tooth.

Polycentropus vernus has been collected most frequently in small intermittent or headwater streams of the Cumberland Plateau physiographic region during Spring.

Types: Holotype. Male, United States: Alabama: Fayette County: small intermittent stream entering Wallace Branch at headwaters, 5.5 mi SE Berry, T16S-R10W-Sec. 36, sweep net, 16.v.1982, S. C. Harris. *Paratypes.* Fayette Co., same data as holotype, 10 males; same data except 26.iv.1983, 1 male; same data except 26.iv.1983, 1 male metamorphotype; same data except 15.iii.1984, 1 male; same data except 11.iv.1984, 9 males; same data except Wallace Branch at headwaters, 5 mi SE Berry, 16.v.1984, 2 males; Tuscaloosa Co., Wallace Branch, 5 mi S Berry, T17S-R10W-Sec. 10, 28.iv.1982, 1 male, S. C. Harris; same data except 25.iv.1982, 1 male; Little Tyro Creek, 6 mi SE Berry, T17S-R10W-Sec. 11, 16.v.1984, 2 males, P. E. O'Neil and R. L. Smith; same data except 19.iii.1982, 1 male; small intermittent stream entering Little Tyro Creek, 6 mi SE Berry, T17S-R10W-Sec. 11, 26.iv.1983, 1 male, S. C.

Harris; Tyro Creek on unmarked Co. Rd., 3.5 mi E New Lexington, T17S-R10W-Sec. 15, 28.iv.1982, 1 male; Walker County: Wolf Creek off Hwy 102, 7 mi S Carbon Hill, 26.iv.1983, 1 male, S. C. Harris and P. E. O'Neil.

Etymology: Latin, "of springtime," referring to this species being most frequently collected in early Spring.

Polycentropus confusus Species-Group Checklist

- P. alabamensis* Hamilton, Harris and Lago, n. sp.—U.S.: Alabama
P. blicklei Ross and Yamamoto, 1965—Canada: Ontario, Quebec; U.S.: Alabama, Delaware, Georgia, Kentucky, Maryland, Mississippi, New Hampshire, New Jersey, New York, Pennsylvania, South Carolina, Tennessee, Virginia
P. carlsoni Morse, 1971—U.S.: Alabama, South Carolina
P. carolinensis Banks, 1905—Canada: Quebec; U.S.: Mississippi, New Hampshire, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia
P. chelatus Ross and Yamamoto, 1965—U.S.: Indiana, Tennessee
P. chenoides Ross and Yamamoto, 1965—U.S.: Delaware, New York
P. centralis Banks, 1914—Canada: Newfoundland; U.S.: Alabama, Arkansas, Illinois, Indiana, Kansas, Missouri, New York, Ohio, Oklahoma, Pennsylvania, Tennessee, Texas, Wisconsin
P. confusus Hagen, 1861—Canada: Ontario, Quebec; U.S.: Alabama, Arkansas, Delaware, Georgia, Indiana, Kentucky, Maine, Massachusetts, Michigan, Mississippi, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Tennessee, Virginia, West Virginia, Wisconsin
P. elarus Ross, 1944—Canada: Ontario, Quebec; U.S.: Alabama, Indiana, Kentucky, Massachusetts, New Hampshire, New York, Ohio, Pennsylvania, Tennessee, Virginia
P. floridensis Lago and Harris, 1983—U.S.: Alabama, Florida
P. maculatus Banks, 1908—Canada: Newfoundland, Ontario, Quebec; U.S.: Kentucky, Maine, Massachusetts, New Hampshire, New York, North Carolina, Pennsylvania, South Carolina, Tennessee, Virginia, West Virginia
P. neiswanderi Ross, 1947—U.S.: Ohio
P. pentus Ross, 1941—Canada: Ontario, Quebec; U.S.: Illinois, Maine, Michigan, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Tennessee, West Virginia, Wisconsin, Wyoming
P. pixi Ross, 1944—U.S.: Massachusetts, New Hampshire, New Jersey, New York, Virginia
P. thaxtoni Hamilton and Holzenthal, 1986—U.S.: Georgia
P. vernus Hamilton, Harris and Lago, n. sp.—U.S.: Alabama

ACKNOWLEDGMENTS

The Geological survey of Alabama provided support to the second author during the course of the study and is gratefully acknowledged. Several of the collections were made during projects supported by the Gas Research Institute and the Bureau of Land Management. Patrick O'Neil and Lee Smith helped in the collecting.

LITERATURE CITED

- Banks, N. 1905. Descriptions of new species of neuropteroid insects from the Black Mountains, N.C. Bull. Amer. Mus. Nat. Hist. 21:215-218.
- Banks, N. 1908. Some Trichoptera, and allied insects, from Newfoundland. Psyche 15: 61-67.
- Banks, N. 1914. American Trichoptera—notes and descriptions. Canadian Entomol. 46:252-258.
- Hagen H. 1861. Synopsis of the Neuroptera of North America with a list of South American species. Smithsonian Misc. Collections, 4:1-347.
- Hamilton, S. W. 1986. Systematics and biogeography of the New World *Polycentropus sensu stricto* (Trichoptera: Polycentropodidae). Ph.D. dissertation, Clemson University, Clemson, South Carolina, 257 pp.
- Hamilton, S. W. and R. W. Holzenthal. 1986. Two new species of caddisflies from Georgia (Trichoptera: Polycentropodidae, Hydroptilidae). Proc. Entomol. Soc. Washington 88: 163-166.
- Lago, P. K. and S. C. Harris. 1983. New species of Trichoptera from Florida and Alabama. Ann. Entomol. Soc. Amer. 76:664-667.
- Lago, P. K. and S. C. Harris. 1987. An annotated list of the Curvipalpia (Trichoptera) of Alabama. Entomol. News 98(5):255-262.
- Morse, J. C. 1971. New caddisflies (Trichoptera) from the southeastern United States. J. Georgia Entomol. Soc. 6:77-84.
- Ross, H. H. 1941. Descriptions and records of North American Trichoptera. Trans. Amer. Entomol. Soc. 67:35-126.
- Ross, H. H. 1944. The caddisflies, or Trichoptera, of Illinois. Bull. Illinois Nat. Hist. Survey 23:1-326.
- Ross, H. H. 1947. Descriptions and records of North American Trichoptera, with synoptic notes. Trans. Amer. Entomol. Soc. 73:125-168.
- Ross, H. H. and T. Yamamoto. 1965. New species of the caddisfly genus *Polycentropus* from eastern North America (Trichoptera: Psychomyiidae). Proc. Biol. Soc. Washington 78: 241-246.

Received September 21, 1989; accepted November 20, 1989.